

AMENDMENTS TO THE CLAIMS

1. (Previously Presented) A method of forming oxide layers of varying thicknesses across a semiconductor substrate surface, comprising:

patterning and blocking a semiconductor substrate surface with a layer of photoresist material;

removing a portion of the photoresist material layer to expose a device isolated region on a blocked semiconductor substrate surface;

increasing a differential oxidation rate value of an exposed semiconductor substrate surface comprising converting the exposed semiconductor substrate material from a non-porous silicon material to a porous silicon material;

removing the layer of photoresist material;

oxidizing the semiconductor substrate surface by deposition of an oxide material;

forming a first oxide layer having a first thickness on the exposed semiconductor substrate surface; and

forming a second oxide layer having a second thickness on the blocked semiconductor substrate surface, wherein the first thickness is greater than the second thickness.

2. (Currently Amended) A method of forming oxide layers of varying thicknesses across a semiconductor substrate surface, comprising:

patterning and blocking a semiconductor substrate surface with a layer of photoresist material;

removing a portion of the photoresist material layer to expose a device isolated region on a blocked semiconductor substrate surface;

increasing a differential oxidation rate value of an exposed semiconductor substrate surface comprising converting the exposed semiconductor substrate material from a non-porous silicon material to a porous silicon material;

removing the layer of photoresist material;
oxidizing the semiconductor substrate surface by deposition of an oxide material;

forming a first oxide layer having a first thickness on the exposed semiconductor substrate surface; and

forming a second oxide layer having a second thickness on the blocked semiconductor substrate surface, wherein the first thickness is greater than the second thickness, wherein the step of increasing a differential oxidation rate value further comprises immersing the semiconductor substrate into a solution while passing a current of about 0.1 milliamps per centimeters squared to about 300 milliamps per centimeters squared.

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3. (Original) The method of Claim 2, wherein the solution comprises hydrogen fluoride, an oxidant and a solvent, wherein the solvent is selected from the group consisting of alcohols, glycols, non-protic solvents, and combinations comprising at least one of the foregoing solvents.

4. (Canceled)

5. (Canceled)

6. (Original) The method of Claim 1, further comprising forming a shallow trench using shallow trench isolation.

7. (Original) The method of Claim 6, further comprising filling the shallow trench to form a device isolation region.

8. (Original) The method of Claim 1, wherein the removal of the portion of the photoresist layer further comprises etching the photoresist layer.

9. (Currently Amended) A method of forming oxide layers of varying thicknesses across a semiconductor substrate surface, comprising:

patterning and blocking a semiconductor substrate surface with a layer of photoresist material;

removing a portion of the photoresist material layer to expose a device isolated region on a blocked semiconductor substrate surface;

increasing a differential oxidation rate value of an exposed semiconductor substrate surface comprising converting the exposed semiconductor substrate material from a non-porous silicon material to a porous silicon material;

removing the layer of photoresist material;

oxidizing the semiconductor substrate surface by deposition of an oxide material;

forming a first oxide layer having a first thickness on the exposed semiconductor substrate surface; and

forming a second oxide layer having a second thickness on the blocked semiconductor substrate surface, wherein the first thickness is greater than the second thickness, wherein the step of forming a first oxide layer further comprising depositing a first oxide layer on a porous silicon layer of the semiconductor substrate surface.

10. (Currently Amended) A method of forming oxide layers of varying thicknesses across a semiconductor substrate surface, comprising:

patterning and blocking a semiconductor substrate surface with a layer of photoresist material;

removing a portion of the photoresist material layer to expose a device isolated region on a blocked semiconductor substrate surface;

increasing a differential oxidation rate value of an exposed semiconductor substrate surface comprising converting the exposed semiconductor substrate material from a non-porous silicon material to a porous silicon material;

removing the layer of photoresist material;
oxidizing the semiconductor substrate surface by deposition of an oxide material;

forming a first oxide layer having a first thickness on the exposed semiconductor substrate surface; and

forming a second oxide layer having a second thickness on the blocked semiconductor substrate surface, wherein the first thickness is greater than the second thickness, wherein the step of forming a second oxide layer further comprising depositing a second oxide layer on a non-porous silicon layer of the semiconductor substrate surface.

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11. (Previously Presented) The method of Claim 1, wherein the formation of the first oxide layer having the first thickness on the exposed semiconductor surface further comprises depositing said oxide material by chemical vapor deposition at temperature of about 750 °C to about 800 °C.

12. (Previously Presented) The method of Claim 1, wherein the formation of the second oxide layer further having the second thickness on the blocked semiconductor substrate surface further comprises depositing said oxide material by chemical vapor deposition at temperature of about 750 °C to about 800 °C.

13. (Previously Presented) The method of Claim 1, wherein the step of increasing the differential oxidation rate value further comprises deposition of a porous silicon material on the exposed semiconductor substrate material by chemical vapor deposition.

14. (Previously Presented) The method of Claim 1, wherein the step of increasing the differential oxidation rate value further comprises deposition of a porous silicon material on the exposed semiconductor substrate material by an epitaxial silicon process.

15. (Previously Presented) A method for fabricating multiple gate oxide thicknesses across a semiconductor substrate surface, comprising:

- photomasking a semiconductor substrate surface with a photoresist material;
- etching a portion of the semiconductor substrate surface;
- converting a non-porous semiconductor substrate material into a porous semiconductor substrate material;
- stripping the photoresist material;
- oxidizing the semiconductor substrate surface by deposition of an oxide material; and
- forming two or more gate oxides, wherein a first gate oxide has a thickness greater than a second gate oxide thickness.

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16. (Original) The method of Claim 15, wherein the converting further comprises immersing the semiconductor substrate into a hydrogen fluoride electrolytic bath while passing a current of about 0.1 milliamps per centimeters squared to about 300 milliamps per centimeters squared through the bath.

17. (Original) The method of Claim 15, wherein the forming further comprises forming the first gate oxide on a porous silicon layer of the semiconductor substrate surface.

18. (Original) The method of Claim 15, wherein the forming further comprises forming a second gate oxide on a non-porous silicon layer of the semiconductor substrate surface.

19. (Currently Amended) A method of forming oxide layers of varying thicknesses across a semiconductor substrate surface, comprising:

photomasking a semiconductor substrate surface with a photoresist material;

etching a portion of the semiconductor substrate surface;

increasing a differential oxidation rate value of an etched portion of the semiconductor substrate surface comprising converting the etched portion of the semiconductor substrate surface from a non-porous silicon material to a porous silicon material forming a layer of porous silicon;

stripping the photoresist material;

oxidizing the semiconductor substrate surface by deposition of an oxide material; and

depositing two or more oxide layers, wherein a first oxide layer on the layer of porous silicon has a thickness greater than a second oxide layer thickness.

20. (Previously Presented) The method of Claim 19, wherein the depositing of the two or more oxide layers further comprises depositing the first oxide layer on the etched portion of the semiconductor substrate surface.

21. (Previously Presented) The method of Claim 19, wherein the depositing of the two or more oxide layers further comprises depositing a second oxide layer on a non-etched portion of the semiconductor substrate surface.

22. (Canceled)

23. (Previously Presented) The method of claim 19 wherein the step of forming a porous silicon is by depositing a layer of porous silicon material on the etched portion of the semiconductor substrate surface.

Election of Species:

Applicants hereby elect, with traverse, Species I, drawn to a method for forming oxide layers of varying thicknesses with increasing differential oxidation rate value by converting a non-porous silicon material to a porous silicon material. Species I, as defined by the Examiner, includes claims 1-3, 6-14, 19-21 and 23 in accordance with the present amendment.